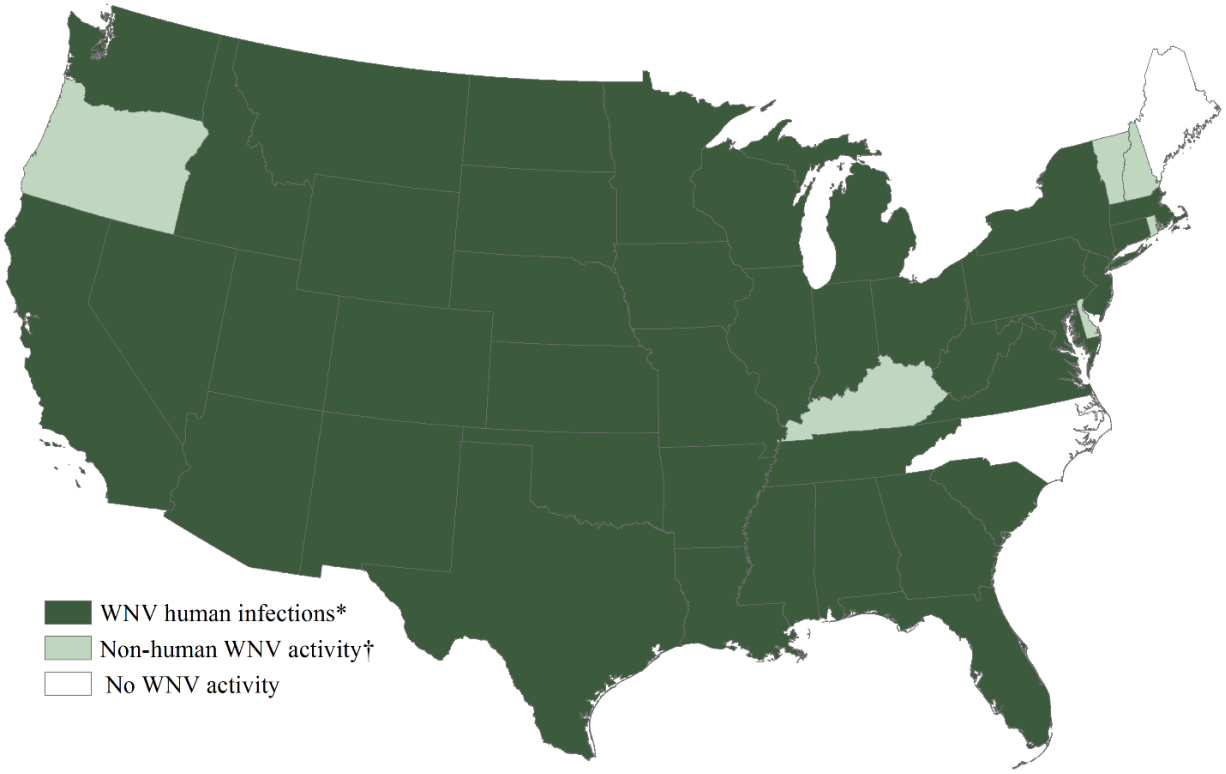
West Nile virus and other arboviral activity -- United States, 2014
Provisional data reported to ArboNET
Tuesday, October 7, 2014

This update from the CDC Arboviral Disease Branch includes provisional data reported to ArboNET for **January 1 – October 7, 2014** for nationally notifiable arboviruses other than dengue. Additional resources for ArboNET and arboviral diseases are provided on page 10.

West Nile virus (WNV) activity in 2014

As of October 7th, 804 counties from 46 states and the District of Columbia have reported WNV activity to ArboNET for 2014, including 40 states and the District of Columbia with reported WNV human infections (i.e., disease cases or viremic blood donors) and 6 additional states with reported WNV activity in non-human species only (i.e., veterinary cases, mosquito pools, dead birds, or sentinel animals) **[Figure 1]**.

Figure 1. West Nile virus (WNV) activity reported to ArboNET, by state — United States, 2014 (as of October 7, 2014)



*WNV human disease cases or presumptive viremic blood donors. Presumptive viremic blood donors have a positive screening test which has not necessarily been confirmed.

†WNV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals

WNV human infections reported for 2014

Reported WNV disease cases

To date, a total of 1,301 human cases of WNV disease have been reported from 375 counties in 39 states and the District of Columbia **[Table 1]**. Dates of illness onset for cases ranged from January–September **[Figure 2]**.

Of all WNV disease cases reported, 569 (44%) were classified as non-neuroinvasive disease and 732 (56%) were classified as neuroinvasive disease (e.g., meningitis, encephalitis, acute flaccid paralysis) **[Figure 3].** Additional demographic and clinical characteristics of reported cases are provided [**Table 7]**.

Presumptive viremic donors (PVDs)

To date, a total of 245 WNV presumptive viremic blood donors have been reported from 29 states **[Table 1]**. Of these, 25 (10%) developed clinical illness.

Table 1. West Nile virus infections in humans reported to ArboNET, 2014

	Human disease cases reported to CDC*				Presumptive viremic blood donors
State	**Neuroinvasive**	**Non-neuroinvasive**	**Total**	**Deaths**	
Alabama	0	1	1	1	3
Arizona	39	11	50	7	11
Arkansas	4	1	5	1	0
California	274	153	427	12	62
Colorado	37	62	99	4	6
Connecticut	2	1	3	0	3
District of Columbia	1	2	3	0	0
Florida	7	3	10	1	4
Georgia	10	1	11	1	0
Idaho	5	13	18	0	0
Illinois	19	9	28	1	2
Indiana	4	0	4	0	0
Iowa	4	8	12	0	3
Kansas	4	24	28	0	7
Louisiana	54	52	106	5	15
Maryland	3	0	3	0	2
Massachusetts	2	1	3	0	1
Michigan	1	0	1	0	1
Minnesota	2	8	10	0	5
Mississippi	28	16	44	5	5
Missouri	9	1	10	1	5
Montana	3	2	5	0	0
Nebraska	34	65	99	1	26
Nevada	3	0	3	0	0
New Jersey	3	2	5	0	0
New Mexico	10	4	14	1	3
New York	11	4	15	0	6
North Dakota	11	6	17	1	1
Ohio	6	1	7	1	0
Oklahoma	5	9	14	0	11
Pennsylvania	5	1	6	0	2
South Carolina	2	0	2	0	2
South Dakota	12	39	51	0	0
Tennessee	5	1	6	0	1
Texas	100	55	155	2	42
Utah	1	1	2	0	0
Virginia	3	1	4	1	1
Washington	5	3	8	0	2
West Virginia	0	0	0	0	2
Wisconsin	4	3	7	1	11
Wyoming	0	5	5	0	0
Totals	**732**	**569**	**1,301**	**47**	**245**

*Includes confirmed and probable cases

Figure 2. WNV disease cases reported to ArboNET, by week of onset — United States, 2014

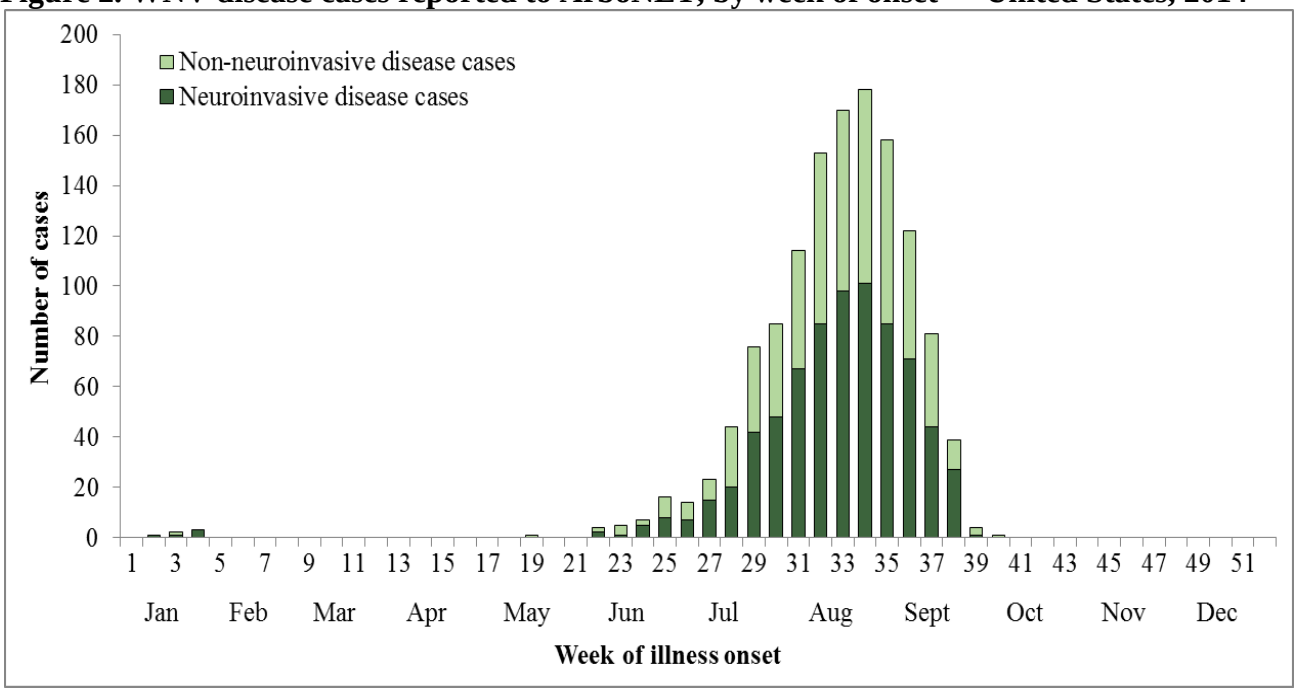
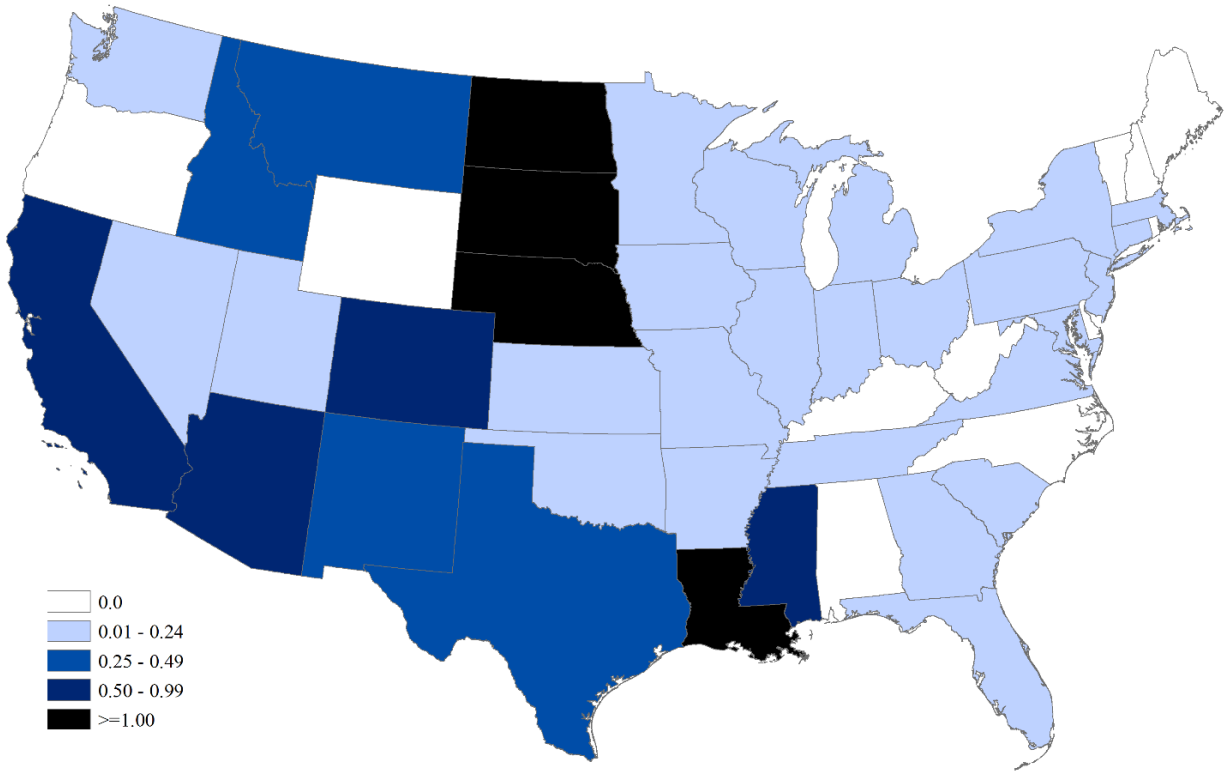


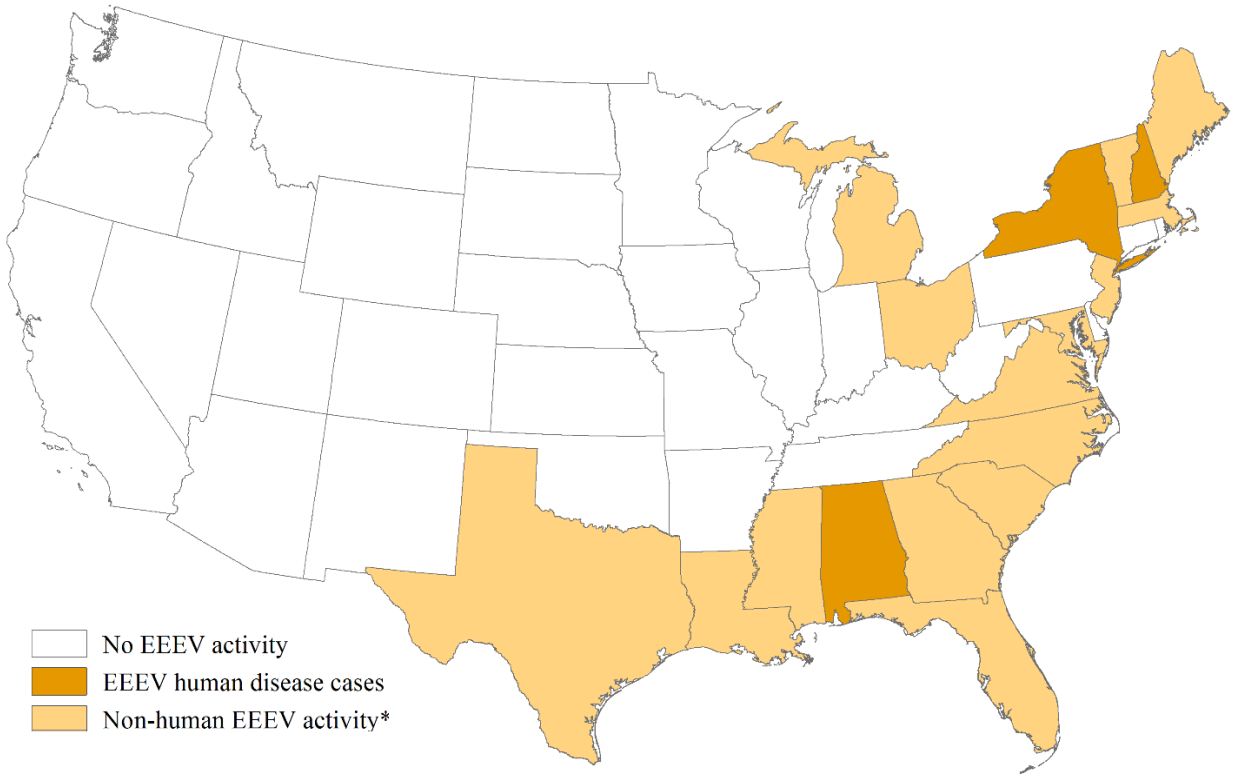
Figure 3. West Nile virus (WNV) neuroinvasive disease incidence reported to ArboNET, by state — United States, 2014 (as of October 7, 2014)



Eastern equine encephalitis virus (EEEV) activity in 2014

As of October 7th, four counties in three states have reported human cases of EEEV disease to ArboNET for 2014 **[Figure 4 and Table 2].** Fifteen states have reported EEEV activity in non-human species only. Additional demographic and clinical characteristics of reported cases are provided [**Table 7]**.

Figure 4. Eastern equine encephalitis virus (EEEV) activity reported to ArboNET, by state — United States, 2014 (as of October 7, 2014)



*EEEV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals

Table 2. Eastern equine encephalitis virus (EEEV) human disease cases reported to ArboNET, United States, 2014

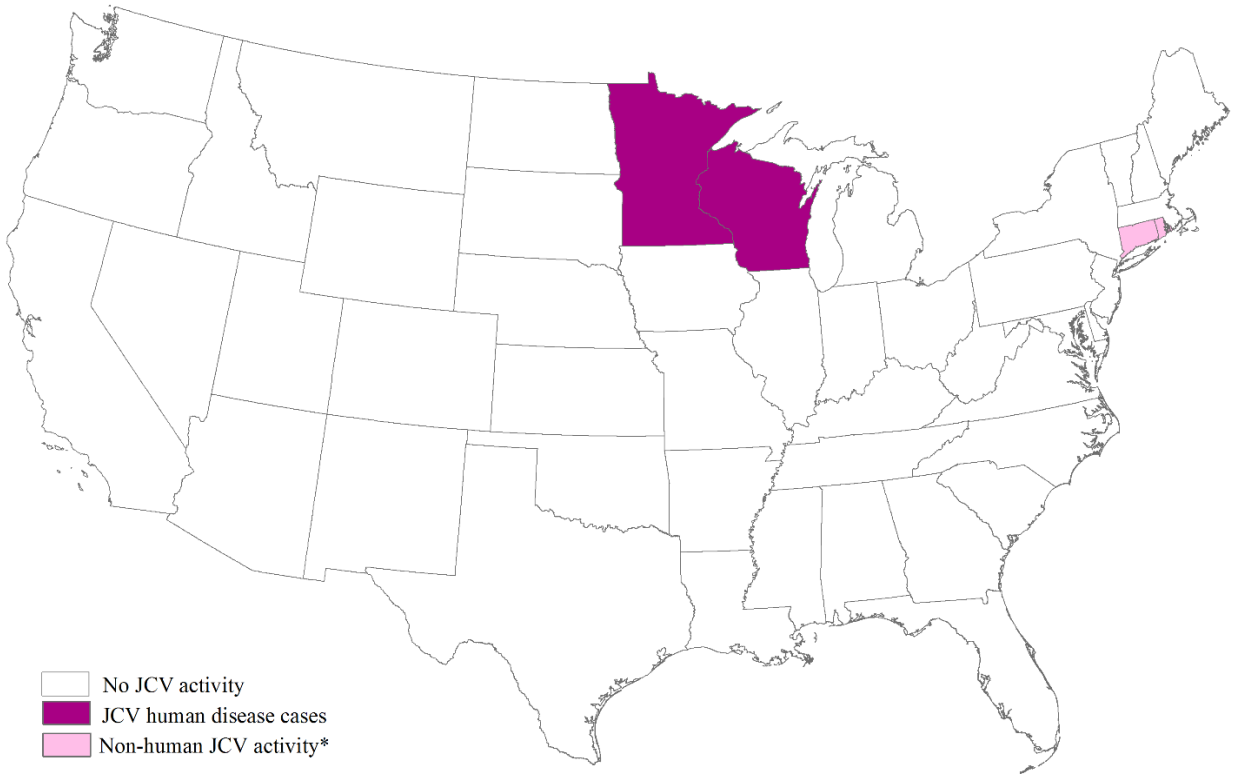
	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Alabama	1	0	1	0
New Hampshire	2	0	2	0
New York	2	0	2	0
Totals	**5**	**0**	**5**	**0**

*Includes confirmed and probable cases.

Jamestown Canyon virus (JCV) activity in 2014

As of October 7th, four counties in two states have reported human cases of JCV disease to ArboNET for 2014 **[Figure 5 and Table 3].** Two states have reported JCV activity in non-human species only. Additional demographic and clinical characteristics of reported cases are provided [**Table 7]**.

Figure 5. Jamestown Canyon virus (JCV) activity reported to ArboNET, by state — United States, 2014 (as of October 7, 2014)



*JCV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals

Table 3. Jamestown Canyon virus (JCV) human disease cases reported to ArboNET, United States, 2014

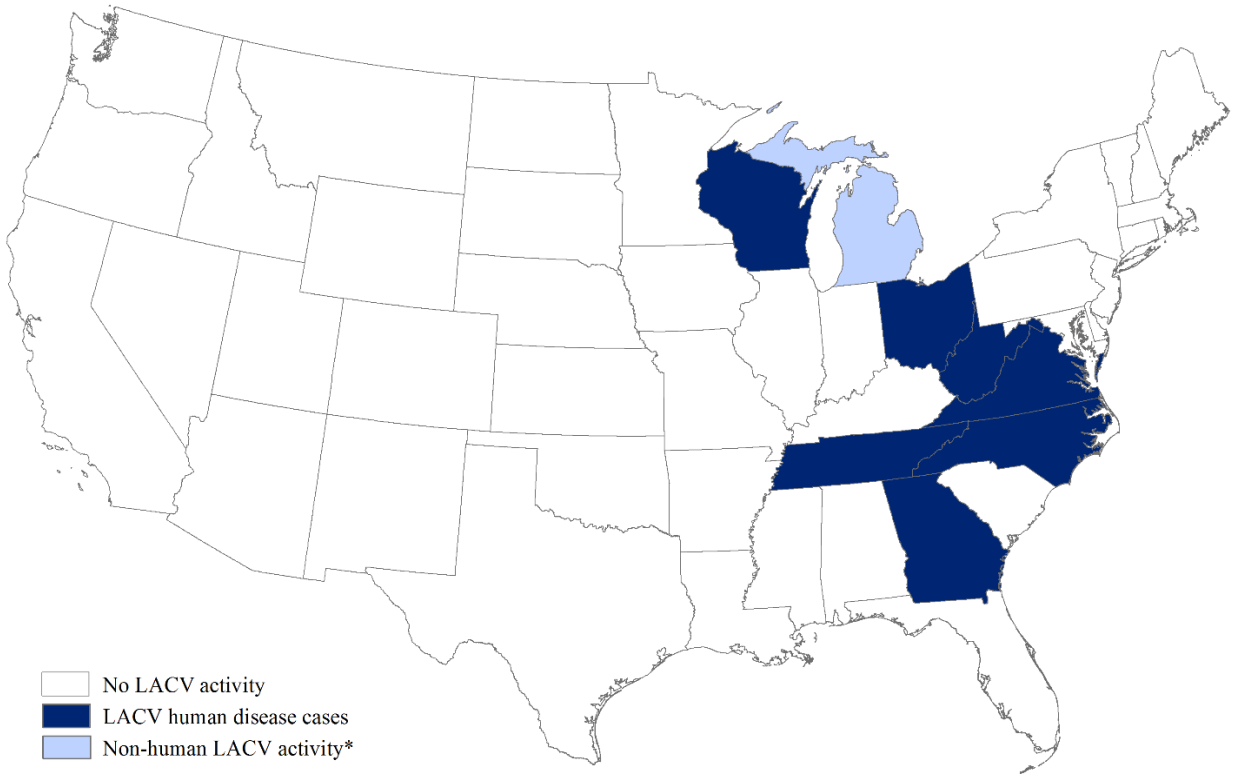
	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Minnesota	1	0	1	0
Wisconsin	2	2	4	0
Totals	**3**	**2**	**5**	**0**

*Includes confirmed and probable cases.

La Crosse virus (LACV) activity in 2014

As of October 7th, 29 counties in seven states have reported human cases of LACV disease to ArboNET for 2014 **[Figure 6 and Table 4].** Michigan has reported LACV activity in non-human species only. Additional demographic and clinical characteristics of reported cases are provided [**Table 7]**.

Figure 6. La Crosse virus (LACV) activity reported to ArboNET, by state — United States, 2014 (as of October 7, 2014)



*LACV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals

Table 4. La Crosse virus (LACV) human disease cases reported to ArboNET, United States, 2014

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Georgia	1	1	2	1
North Carolina	5	0	5	0
Ohio	16	1	17	0
Tennessee	6	0	6	0
Virginia	1	0	1	0
West Virginia	1	0	1	0
Wisconsin	1	1	2	0
Totals	**31**	**3**	**34**	**1**

*Includes confirmed and probable cases.

Powassan virus (POWV) activity in 2014

As of October 7th, five counties in three states have reported human cases of POWV disease to ArboNET for 2014 **[Figure 7 and Table 5]**. Additional demographic and clinical characteristics of reported cases are provided [**Table 7]**.

Figure 7. Powassan virus (POWV) activity reported to ArboNET, by state — United States, 2014 (as of as of October 7, 2014)

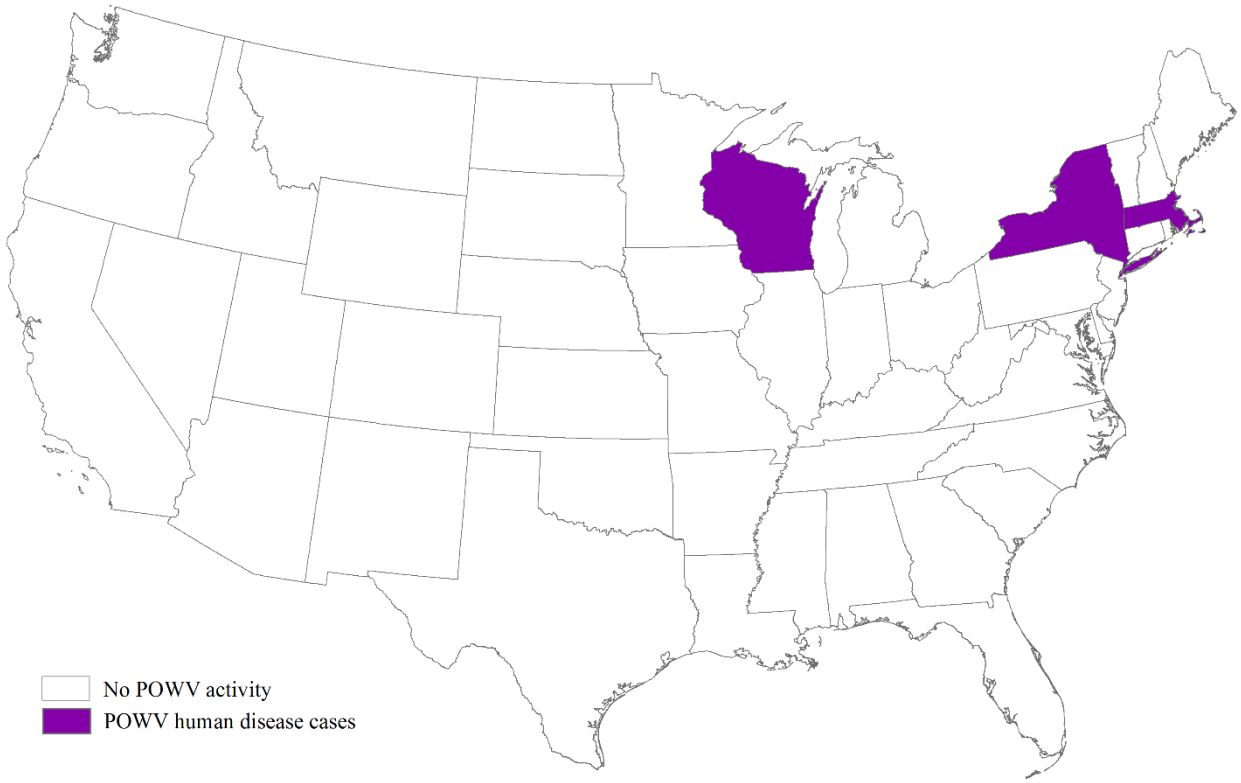


Table 5. Powassan virus (POWV) human disease cases reported to ArboNET, United States, 2014

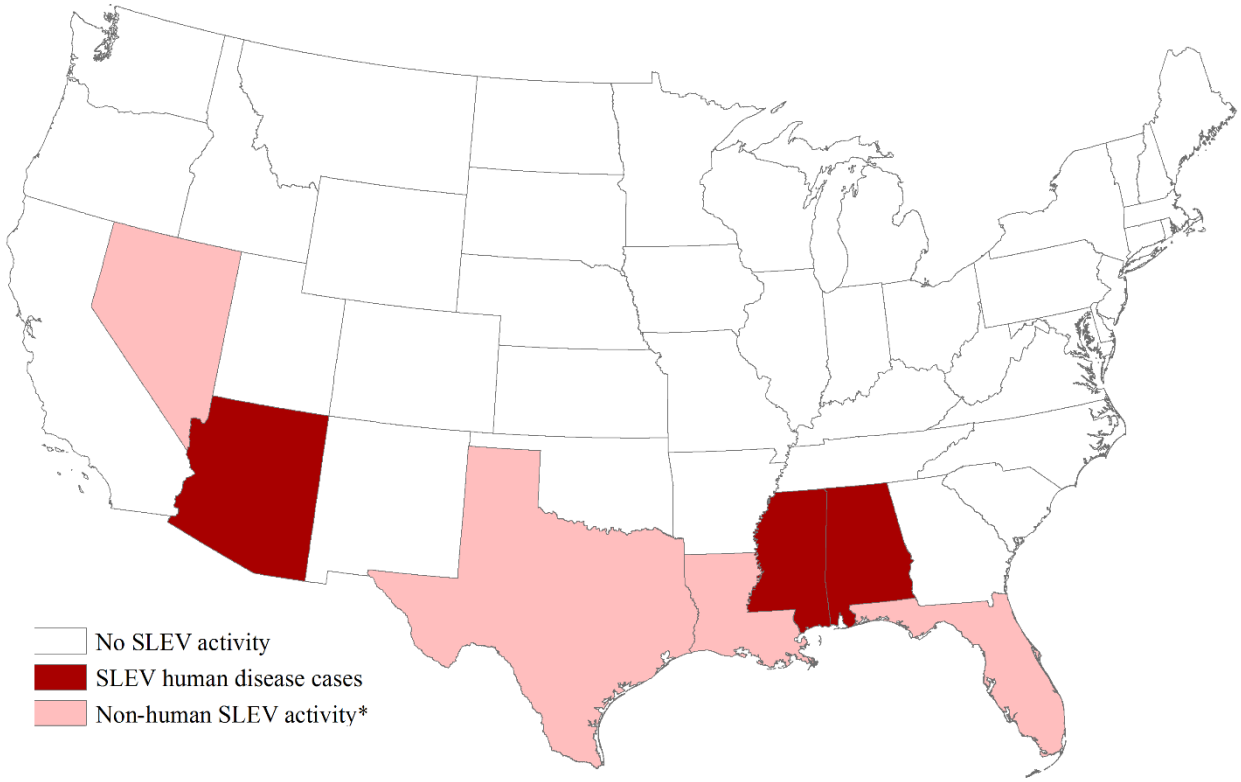
	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Massachusetts	2	0	2	0
New York	0	1	1	0
Wisconsin	2	1	3	0
Totals	**4**	**2**	**6**	**0**

*Includes confirmed and probable cases.

St. Louis encephalitis virus (SLEV) activity in 2014

As of October 7th, three counties in three states have reported human cases of SLEV disease to ArboNET for 2014 **[Figure 8 and Table 6]**. Four states have reported SLEV activity in non-human species only.

Figure 8. St. Louis encephalitis virus (SLEV) activity reported to ArboNET, by state — United States, 2014 (as of October 7, 2014)



*SLEV veterinary disease cases, or infections in mosquitoes, birds, or sentinel animals

Table 6. St. Louis encephalitis virus (SLEV) human disease cases reported to ArboNET, United States, 2014

	Neuroinvasive disease cases	Nonneuroinvasive disease cases	Total cases*	Deaths
Alabama	1	0	1	0
Arizona	0	1	1	0
Mississippi	1	0	1	0
Totals	**2**	**1**	**3**	**0**

*Includes confirmed and probable cases.

Table 7. Characteristics of reported cases of arboviral disease, United States, 2014

	EEE N=5		JC N=5		LAC N=34		POW N=6		WNV N=1,301	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Age group										
<20 years	0	(0)	1	(20)	32	(94)	0	(0)	63	(5)
20-39 years	1	(20)	1	(20)	1	(3)	0	(0)	225	(17)
40-49 years	0	(0)	0	(0)	0	(0)	0	(0)	189	(15)
50-59 years	3	(60)	0	(0)	0	(0)	3	(50)	270	(21)
≥60 years	1	(20)	3	(60)	1	(3)	3	(50)	552	(42)
Unspecified	0	(0)	0	(0)	0	(0)	0	(0)	2	(<1)
Male sex	2	(40)	2	(40)	18	(53)	5	(83)	808	(62)
Onset of illness										
January	2	(40)	0	(0)	0	(0)	1	(17)	6	(<1)
February	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
March	0	(0)	0	(0)	1	(3)	0	(0)	0	(0)
April	0	(0)	0	(0)	0	(0)	2	(33)	0	(0)
May	0	(0)	1	(20)	0	(0)	0	(0)	5	(<1)
June	0	(0)	2	(40)	1	(3)	3	(50)	45	(3)
July	0	(0)	2	(40)	15	(44)	0	(0)	291	(22)
August	2	(40)	0	(0)	13	(38)	0	(0)	727	(56)
September	1	(20)	0	(0)	4	(12)	0	(0)	227	(17)
Clinical syndrome										
Nonneuroinvasive	0	(0)	2	(40)	3	(9)	2	(33)	569	(44)
Neuroinvasive										
Encephalitis	3	(60)	2	(40)	24	(71)	2	(33)	335	(26)
Meningitis	1	(20)	1	(20)	7	(20)	2	(33)	316	(24)
Acute flaccid paralysis†	1	(20)	0	(0)	0	(0)	0	(0)	67	(5)
Other neuroinvasive presentation	0	(0)	0	(0)	0	(0)	0	(0)	14	(1)
Outcome										
Hospitalization	5	(100)	2	(40)	33	(97)	6	(100)	882	(68)
Death	0	(0)	0	(0)	1	(3)	0	(0)	47	(4)

EEE=Eastern equine encephalitis virus; JC=Jamestown Canyon virus; LAC=La Crosse virus; POW=Powassan virus; WNV=West Nile virus

† Fifty two WNV disease cases classified as acute flaccid paralysis also had encephalitis or meningitis. One EEEV disease case also had encephalitis.

About ArboNET

ArboNET is a national arboviral surveillance system managed by CDC and state health departments. In addition to human disease, ArboNET maintains data on arboviral infections among presumptive viremic blood donors (PVDs), veterinary disease cases, mosquitoes, dead birds, and sentinel animals. As with other national surveillance data, ArboNET data has several limitations that should be considered in analysis, interpretation, and reporting **[Box]**.

Box: Limitations of ArboNET data

The following should be considered in the analysis, interpretation, and reporting of ArboNET data:

1. ArboNET is a passive surveillance system. It is dependent on clinicians considering the diagnosis of an arboviral disease and obtaining the appropriate diagnostic test, and reporting of laboratory-confirmed cases to public health authorities. Diagnosis and reporting are incomplete, and the incidence of arboviral diseases is underestimated.
2. Reported neuroinvasive disease cases are considered the most accurate indicator of arboviral activity in humans because of the substantial associated morbidity. In contrast, reported cases of nonneuroinvasive arboviral disease are more likely to be affected by disease awareness and healthcare-seeking behavior in different communities and by the availability and specificity of laboratory tests performed. Surveillance data for nonneuroinvasive disease should be interpreted with caution and generally should not be used to make comparisons between geographic areas or over time.

Additional resources

For additional arboviral disease information and data, please visit the following websites:

- CDC's Division of Vector-Borne Diseases:
  http://www.cdc.gov/ncezid/dvbd/
- National Notifiable Diseases Surveillance System:
  http://wwwn.cdc.gov/NNDSS/script/casedef.aspx?CondYrID=616&DatePub=1/1/2011%2012:00:00%20AM
- U.S. Geological Survey (USGS):
  http://diseasemaps.usgs.gov/
- AABB (American Association of Blood Banks):
  http://www.aabb.org/research/hemovigilance/Pages/wnv.aspx